The Choice Of Land Tenure Contracts In The Presence Of Transaction Costs In Rice Farming In West Java, Indonesia.

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abstract

This study assessed the preference for and efficiency of land tenure contract arrangements in rice farming in West Java, Indonesia. Specifically, it examined the transaction costs associated with land tenure contracts, the land tenure contract preference, the efficiency of land tenure contracts, and the policy agenda to address the problems of land tenure efficiency. Three types of land tenure contracts were considered: sharecropping, fixed rental and mortgage. Farm plot data were used to econometrically investigate whether transaction cost had an effect on the choice of land tenure contracts and on the efficiency of land tenure contracts. The transaction cost coefficient of 0.097 (significant of 1% level) in the choice of land tenure indicates that as the value of transaction cost increases, the landlord will most likely choose sharecropping. However, if the transaction cost decreases, it is more likely that the landlord will choose mortgage or fixed rental. These findings show that contract choice of landlord's is influenced by the transaction cost. The results show that sharecropping is the more efficient land tenure arrangement in West Java, Indonesia. Thus it does not support the Marshallian view of sharecropping as an inefficient land tenure arrangement. Sharecropping in the study area is benefiting both the landlord and the tenant farmers. Transaction cost dismisses as labor monitoring is needed to the barest minimum and higher marginal product is achieved. Adoption of sharecropping in West Java like support the government program of consolidating rice farm to attain scale in economics' and utilization more efficiently farm labor. The government needs to facilitate the dissemination of information on land transaction.

I. Introduction

1.1. Background of Study

It is commonly observed that villagers are stratified into a spectrum of farmers' sub-classes ranging from landless laborers to non-cultivating landlord according to their varying claims to land property. In general, landowners who are unable or unwilling to personally cultivate their land can either employ wage laborers or rent out their land under a share contract or fixed rental contract.

The mode of land exchange in the village may be explained by the underdevelopment of the land market. In a small community, information is often inadequate. The landowner and the tenant need to sacrifice some opportunity to obtain information about the contract arrangements. The time spent by the landowner and tenant to get information about land contracts is costly. This implies that while tenants

face problems in accessing the market due to some restrictions related to information, the landowners' choice of contracts is also influenced by the transaction cost.

There are different tenurial contracts in some areas due to different transaction costs. Cheung (1969) postulated that the transaction cost in fixed rental and wage rate is lower than in sharecropping. If transaction cost plays a fundamental role in the selection of land tenure contract, an examination of how it affects the behavior of landowners and tenants in land tenure contracts is important.

High transaction cost associated with land tenure market can result in the segmentation of such markets whereby certain strata deal only with each other. Land acquisition by the poor through land sales market may prove to be difficult, and the potential for productivity-enhancing land redistribution through sales markets is likely to be very limited.

In urban industries characterized by machine processes, work is highly standardized and easy to monitor. The biological process of agricultural production, however, is subject to infinite variations in ecological conditions. Very different treatments for a crop or an animal are often required in response to slight differences in temperature and soil moisture.

It greatly matters whether a laborer performs his work with careful attention and appropriate adjustment in response to variations in plants, animal and ecology because such work quality is extremely difficult to monitor. The scattering of agricultural operations over a wide open space adds to the difficulty of monitoring. Under such conditions quality of labor, in term of conscientious attention and adjustment, commands a high value. A market is bound to be inefficient or vanish altogether in the absence of asymmetry of such quality information (Arkelof, 1970; Williamson, 1975).

Employment relationship is limited to a spot exchange among anonymous agents in the marketplace; it is very difficult to avoid hiring workers who are dishonest or shirkers, not so much in the duration and intensity of physical work but in the work quality. The problem of moral hazard or dishonesty can be equal or more serious in type of contracts arrangement.

The sharecropping contract could be associated with sizeable inefficiency and high transaction cost. Sharecropping is related with a prohibitively high cost of monitoring tenant's activities. This leads to inefficiency of sharecropping based on the presumption of the tenant's application of less variable input to the rented land

relative to alternative contractual arrangement (Pincus, 1996). Given the above consideration, the transaction cost influences the efficiency of land distribution and farm production in land tenure contracts arrangement. The complete information about the sources of transaction cost and the factors affecting transaction costs is important for land market and farm production improvement. This information is also a useful guide to government intervention in improving land market in the study area.

1.2. Objectives of the Study

In general, this study aimed to analyze the choice of land tenure contracts in the presence of transaction costs in rice farming in West Java, Indonesia.

Specifically, this study sought to:

1. examine the transaction costs associated with land tenure contracts in West Java, Indonesia;
2. analyze the choice of land tenure contract given the transaction cost in West Java, Indonesia;

II. Methodology

2.1.The Samples and Variables

Data were gathered through personal interviews of farmers. The survey included detailed information on the choice of tenure contract, cropland area operated, labor use, input use, value of output per unit of land, and characteristics of farmers (cropland owned, household labor force, education of household head, characteristics of field, input and output, income, expenditures, and non-agriculture activities). Detailed information on land tenure decisions in rice cultivation were obtained. Secondary data were also gathered on the history of land ownership and on the process of how the land was fragmented.

Four villages were selected in the Karawang and Subang districts. One village in Karawang was located near the industrial area where income from agriculture was minor and where there was a high competition between agriculture and industry in the use of labor (Wanasari Village, *Kecamatan* Teluk Jambe). The other village was far

from the industrial area where agricultural activities greatly contributed to the farmers' income and where competition with industry for labor was still low (Telarsari Village, Kecamatan Jatisari).

The total sample fields consisted of 241 units distributed among the following: landowners - 80 unit samples, cropland rented out - 34 unit samples, cropland rented -127 unit samples, fixed rental arrangements - 39 units, sharecropping arrangements - 57 units, and mortgage arrangements - 31 units. Every respondent was interviewed using a pre-tested questionnaire.

The data collected consisted the type of contract with all their attributes, type of soil, farm size, plot location, social factor among the tenant and the landlord, demographic characteristics, farm activities, and assets. The main sources of information were the farmers (landlords and tenants) and officers of agricultural agencies and extension offices.

2.2. Methods of Analysis

a. Transaction Cost

The transaction cost was computed as follows:

$$TC = \frac{NFxTN}{BT} xOP$$

Where

TC = value of transaction costs (Rupiah)

NF = total number of face-to-face meeting and monitoring

TN = time spent for negotiation and monitoring (hours)

BT = numbers of hours for one day working (7 hours)

OP = opportunity of the landlord and tenant (Rupiah)

The opportunity cost of the landlord's time was related with their income from agricultural and non-agricultural activities. For the tenant, the opportunity cost was based on the average wage in agricultural activities.

The other components of transaction cost were :

1. **Negotiation Cost**, cost of time to reach an agreement between the tenant and the landlord about the contract details, the responsibility of each other, the method of payment, and the time to prepare the contract until approved.
2. **Monitoring Cost**, cost of the partners to observe the transaction as it unfolded, and the cost to verify compliance with the agreed terms. Monitoring costs are the costs that partners make to observe the transaction as it unfolds, and to verify the compliance with the agreed terms. They may be incurred in the form of litigation or administrative proceedings.

Most of the transaction costs were connected with trust, which could be bestowed by an individual on another or to a group of individuals (Zaheer, et al. 1998). This study considered trust (personal orientation) of a landlord towards his/her tenant. Because trust was difficult to measure directly, the researcher used some variables that influenced the trust between the landlord and the tenant.

The model to estimate the factors affecting transaction cost is :

TC = f{y, r, nh, nf, e, d, s, u}

Where :

y = length of time that farmers had used the land (measured the duration of relationship between landlord and tenants). The longer the duration, the higher the level of trust and thus, a reduction in transaction cost.

r = relation of landlord and tenant (relative or not). If tenant was a relative of the landlord, trust will increase and transaction cost (r) will decrease.

nh = number of hired labor. The more hired labor used, the higher the potential for labor-shirking because true work effort by the workers is not easily verifiable and increases the monitoring cost.

nf = number of family labor. The more family labor used, the smaller the chance of labor-shirking, thus decreasing monitoring cost.

e = the erodibility of land (erosion). The more eroded the land, the more will be the potential for land mismanagement and increased transaction cost.

d = distance of the land cultivated to the farmer's house. If the land was far from the house of the landlord, uncertainty will increase because it will be difficult

to monitor the tenants' activities. Therefore, if land is located far from the landlord's house, transaction cost will increase.

s = size of landholding. The greater the size of landholding, the greater would be the opportunity for land mismanagement because of economies of scale in supervision (Datta. et al., 1986). The greater the size of landholding, the greater would be the potential transaction cost.

u = an unobserved error term.

Table 1. Independent variables of transaction cost in rice farm activities, West Java, Indonesia, 2004

VARIABLE	DEFINITION	RELATIONSHIP BETWEEN DEPENDENT AND INDEPENDENT VARIABLE
Years relation	Number of years that the farmers used the land (duration of relationship between land owner and tenant)	Negative
Relative	Relative = 1 If tenant and landlord are relative, and zero otherwise	Negative
Hired labor	Numbers of man days that labor was hired to work in one season.	Positive
Family labor	Numbers of man days that family labor worked in one season.	Negative
Erosion	Erosion = 1 If farmer has erosion problem, and zero otherwise	Positive
Distance	Distance of the land cultivated from the farmer's house (meter)	Positive
Cropland area operated	Total cropland area operated by the farmer (hectares)	Positive

b. Contract Choice

The probit model was used to predict the probability of choice of tenure arrangement. For independent variables, the explanatory variables were asset, value

of livestock, crop land own.The greater the value of asset, livestock, and cropland owned, the higher was the probability that the landlord would choose sharecropping because he/she does not have cash constraints (Pender and Fafchamps, 2002). Greater household labor supply will increase the probability that the landlord would choose fixed rental and mortgage arrangement. If labor effort was unobservable, sharecropping would dominate fixed rental because of its risk-pooling advantages (Stiglitz, 1974). The greater the transaction cost, the greater the probability that the landlord would chose sharecropping .

The part-time farmer will tend to choose fixed rental or mortgage because he/she has a high opportunity to get another job and would limit his/her involvement in farm activities. If the landowner was a relative of the tenant or if the tenant and the landlord have established a long-term relationship, the transaction costs may be lower, thus favoring sharecropping over a fixed rental arrangement. Thus, the variable indicating that the landlord was a relative of the tenant and that the farmer has farmed the plot for more number of years were included.ed, household labor supply, transaction cost (information cost, negotiation cost and monitoring cost), relation of landlord and tenant (relative or not), number of years for the landlord and tenant relation, and the landlord's main activity.

Table 2. Independent variables of lease contract choice in rice farm activities, West Java, Indonesia, 2004

VARIABLE	DEFINITION	RELATIONSHIP BETWEEN DEPENDENT AND INDEPENDENT VARIABLE [b]
Cropland owned	Total cropland owned by the farmers (hectares)	Positive
Household labor supply	Numbers of man-days that household members worked in one season.	Negative
Asset	Total assets (in score)	Positive
Livestock	Value of total livestock [a] (Rp)	Positive
Years relation	Length of time that the farmers used the land (duration of relationship between landowner and tenant)	Positive
Relative	Relative = 1 If landlord and tenant were a relative, and zero otherwise	Positive
Part-time farmers	Part-time farmers = 1 If respondent is part-time farmers, and zero otherwise	Negative
T-cost	Total transaction cost paid by landlord/output (Rp/kg)	Positive

[a] Ending inventory value at the time of interview
[b] In relation with sharecropping arrangements

III. The Concept of Transaction Costs

The concept of transaction costs has been widely applied, but with slightly different meanings. These include analysis of organizational structures (e.g., to examine whether or not vertical integration is preferable to contracting), causes of market failures (e.g. externalities caused by the lack of property rights or asymmetric information), institutional choices (e.g., promotion of clubs), and policy choices (e.g., administration costs associated with policy implementation). The outcome of the analytical work on multifunctionality suggests that attention may indeed need to be given to the various issues arising under the heading of transaction costs.

The first systematic discussion of the role of transaction costs in relation to the allocation of resources was Ronald Coase's path-breaking article, "The Problem of Social Cost" (cite source). The context of the misallocations were various "technological externalities" in the situation where production of one good was, in the case, a negative input in the production of some other good. The example first cited was the historically important case of straying cattle: a rancher-producer raises cattle who invariably trample some of a neighboring farmer's crop (Coase, 1961, 1992).

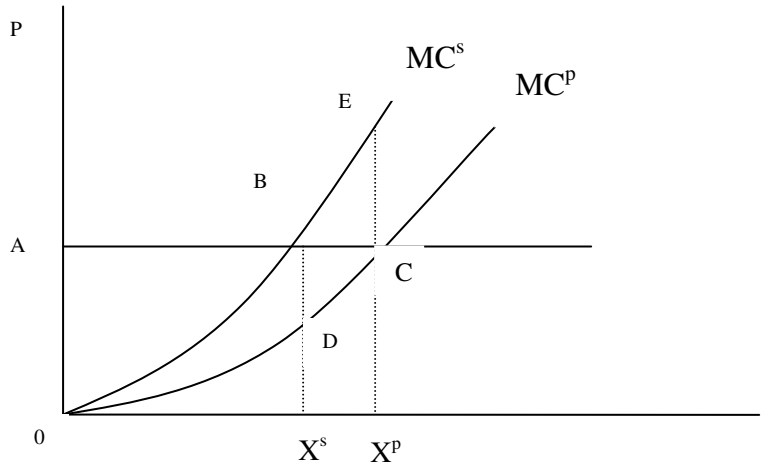

Figure 1. Private and Social Marginal Cost according to Coase (Silberberg and Suen, 2001)

The figures indicate the difference between social and private cost. The curve MC^p misspecifies the marginal cost of producing cattle in the present example by excluding the cost of destroyed crops. The marginal destruction of crops, the side effect, or externality, is represented by the vertical difference between MC^s, social marginal cos and MC^p. It was formerly alleged that if the rancher was not legally liable for the damaged crop, Xp would be produced. If the rancher is not liable for damage done to crops, the farmer will contract to pay the rancher more than BCD (but less than BECD) for the rancher to produce Xs instead of Xp. Since both parties will gain, such a contract is implied.

The assumption Coase used in the previous part is zero transaction cost. If transaction costs are not zero, foregone gains from trade may exist. To point this out, however, is to only begin the problem. The parties involved still have an incentive to consider various contracts to extract some of the mutual benefits. Different contracts have different negotiation and enforcement costs associated with them. The

hypothesis is the basis for an emerging theory of contracts, based on maximizing behavior.

Transaction cost of any contract included both the loss of the landowner arising from labor-shirking and the output underreporting and land mismanagement resulting from the worker-tenant relation. Another source of transaction cost was the expenditure of both the landowner in monitoring the worker-tenants and the worker-tenant in job-search.

Standard economic theory implicitly assumed that the factors of production are subject to complete control and predictable performance (Datta et al., 1986). However, this assumption holds only when all factors are owned by the same party. For rice farm activities in West Java, where land and labor were owned by different parties, control by one agent was incomplete. Another agent was required to monitor the performance of the other(s).

One problem related with transaction cost in land tenure contract arrangement is how to measure the value of transaction cost. Most of the previous studies, except Roumasset and Uy (1980), calculated the transaction cost indirectly by using some statistical indicator for the existence of transaction cost. Roumasset and Uy (1980) limited the transaction cost to those borne by the employer in the context of a relationship between the owners and managers of firms. Dyer and Chu (2000) tried to explore and measure the component of transaction cost in the supplier-automaker exchange relationships in the U.S., Japan, and Korea. Most of the approaches in this thesis followed what Dyer and Chu (2000) had done.

While monitoring was required, it tended to create transaction costs. Another source of transaction cost was that cost borne by the consumer that was not transferred to the seller of the good. Indeed, transaction cost is commonly conceived as the difference between what a consumer pays and what a seller gets. In this study transaction, cost was divided into ex-ante transaction cost and ex-post transaction cost.

Ex-ante transaction costs. To measure total transaction costs, the farmers were asked to estimate ex-ante transaction costs (information and negotiation costs) and ex-post transaction costs (implementation and monitoring costs). The components of information costs included brokerage's fee and time spent by the landlord and tenant to obtain information about land contracts.

The landowner and tenant were interviewed to better understand the issues arising in land tenure arrangement. To minimize information bias and follow the general recommendation to use the most knowledgeable informant (Kumar et al., 1993), the researcher also talked with the head of the local tribe and with an agricultural extension officer. The latter stayed in the villages and learned about the day-to-day relationship between the landowners and the tenants.

To measure information cost, the researcher asked the tenant and landowners to estimate the number of "person days" they used to get information about the land tenure contract arrangement. Another component of information cost was brokerage fee. In all the villages, the farmer intending to rent out a land, especially for fixed rental and mortgage, informed a mediator who then tried to find a person who wanted to rent land. If the transaction succeeded, the mediator was paid around 1-5 percent from the total amount of contract value for one term of transaction.

IV. Result and Discussion

4.1. Components of Transaction Cost

To determine the relationship between transaction cost and land market in the study areas, information about the type and sources of transaction cost in land tenure contract arrangements will be examined. On the average, information cost for mortgage and fixed rental was higher than in sharecropping (Table 3). Most of the component information costs were for broker's fee, which was around 1-5 percent of the total payments. This was paid by the landowner and tenant. The calculation of the transaction cost in Table 3 was divided into two: the rupiah per hectare in one period of planting (3-4 months) and the rupiah per kilogram output in one term of contract. In reality the contracts for mortgage lasted for two years and one year for fixed rental. In fixed rental and mortgage, more than 80 percent of the transaction cost for one season and in every kilogram of output in one term of contract was information costs.

Table 3. Transaction costs of rice farm activities by land tenure arrangement for one season, per kilogram of output, West Java Indonesia, 2004

COMPONENTS OF TRANSACTION COSTS	SHARECROPPING	FIXED RENTAL	MORTGAGE
Per-hectare/season (Rp/ha)			
A. Information cost	26,912(25.6%)	144,394(81.6%)	163,832(84.0%)
1.Information cost	18,379	5,892	3,820
2.Broker fee	8,533	138,502	160,012
B. Negotiation cost			
1.Face-to-face meeting	10,970 (10.4%)	5,712 (3.2%)	4,071 (2.1%)
C. Implementation cost			
1.Legal cost	1,336 (1.3%)	20,263 (11.4%)	19,372 (9.9%)
D. Monitoring cost			
1.Observation cost	65,823 (62.7%)	6,595 (3.7%)	3,813 (4.0%)
Total transaction cost for one season	105,041 (100%)	176,964 (100%)	191,088 (100%)
Per kg of output (Rp/kg)			
A. Information cost	7.3 (19.3%)	60 (83.6)	154 (88.9%)
1. Information cost	4.9	2	4
2. Broker fee	2.4	58	150
B. Negotiation cost			
1. Face-to-face meeting	3.2 (8.9%)	2.3 (3.3%)	3.8 (2.2%)
C. Implementation cost			
1. Legal cost	0.4 (1,0%)	6.7 (9,3%)	8.1 (4.7%)
D. Monitoring cost			
1. Observation cost	26.9 (71.1%)	2.7 (3.8%)	2.3 (4.2%)
Transaction Cost/kg of output	37.9 (100%)	71.8 (100%)	170.1 (100%)

( ) = Percent to total transaction cost

Negotiation costs are costs incurred for the tenant and landlord to reach an agreement and sign the contract and for the time to prepare the contract until its approval. To measure negotiation cost, landowners and tenants were asked how much time they utilized for face-to-face communication to reach an agreement.

In fixed rental and mortgage, the face-to-face communication was relatively short because most of the terms of agreements have already arranged by the mediator. Therefore, negotiation cost in fixed rental and mortgage made up only around 2-3 percent of the total transaction cost. In sharecropping arrangement, the face-to-face communication was more important because only a few of landlords and tenants used the mediator. The negotiation cost in sharecropping was around 9-10 percent of the total transaction cost.

Implementation costs are defined as costs of negotiating the refinements to projects as new knowledge becomes available indicating that such refinements are advisable. The main component of the cost is the payment of legal fees for village administration. Most of fixed rental and mortgage are writing of the contract and paid for the official legal fees. In the other side, only few writing contracts in sharecropping arrangements, therefore the value of implementation cost in sharecropping was only around 1 percent of the total transaction cost.

Monitoring costs are the landlord activity to observe the tenants' working activities. Almost all of the landlords in sharecropping arrangements performed these tasks; thus a major cost component was the opportunity cost of the landlord. In mortgage arrangement, the monitoring costs are relatively lower than fixed rental, because in some cases, the creditors leased-in the land in a sharecropping arrangement, hence becoming tenants in their own lands.

In sharecropping arrangement, the landowner monitors the tenant's activities in land preparation and fertilizer utilization. In some cases, the landowner assigns his/her family worker during harvest time to minimize the underreported outputs. Monitoring cost in sharecropping arrangement comprises around 60-70 percent of the total transaction cost.

Brokerage's fee and mediator. The main component of transaction cost in mortgage and fixed rental was the broker's fee. In all the villages studied, the farmer intending to rent out land informed a mediator, who tried to find a person who wanted to rent it. If the transaction succeeded, the mediator was paid around 1-5 percent of the total value of transaction. The owner and the farmer who rented the land shouldered this cost. The highest brokerage fee was in mortgage. On the average, for every kilogram output, the broker's fee for mortgage was more than twice that of fixed rental and almost 20 times that of sharecropping arrangement. (Table 3).

The existence of a mediator in all the villages was related to land sales and purchases, especially in the villages near the industrial areas. Some industrial areas have influenced the land transaction in these areas. City dwellers rather than the local people tended to own land in the villages located near industrial areas. Most of these lands are not being cultivated but are used for speculation. In both situations, the existence of a mediator was an urgent aspect in transaction, because a mediator facilitated the transaction process.

Most of the mediators were either village officials or agricultural extension officers who stayed in the village and had access to information about the farmers who wanted to sell or rent out their lands. The mediator was a semi-formal broker in the villages. Farmers who did not use their services, especially in mortgage and fixed rental, were more likely to encounter legal problems.

4.2. Share of Transaction Costs to Total Factor Payment

One interesting analysis related with transaction cost was the contribution of transaction cost to total factor payment. Factor payment is the conversion of the factor-product price to product price ratios. The higher the factor payment, the higher the contribution of factor production to the total cost of production.

Table 4 presents the factor payments and factor share values of inputs used by different categories of tenure arrangement. There were observed mean differences in input use among the types of tenure contracts. Input use influenced the factor payments and the factor shares in land productivity. The land productivity in mortgage arrangement was higher compared with others because most of the tenants in mortgage contract used more seeds and fertilizers.

The main components of factor payment were labor, land, and tenant managerial fee (Table 4). Factor share of labor for all tenurial arrangements was relatively the same at around 23-25 percent. The factor shares of mortgage for land was significantly lower compared with others, which meant that the cost of using land for the tenant mortgage arrangement was lower. Faced with capital constraint, especially the need for immediately cash to support economics of the family, the landowner has no other alternative to settle for a lower mortgage arrangement.

Since productivity in mortgage was relatively high and the factor payments for land was relatively lower, the average factor shares for the tenant's managerial skill in mortgage was higher compared with others. Factor share for the tenant's managerial skills was lowest for fixed rental arrangement. The main factor that influenced the lowest

Table 4. Factor payments [a] and factor shares [b] per hectare in rice farm activities for different tenure arrangements in one season, West Java, Indonesia, 2004

INPUT	SHARE-CROPPING Quantity	%	FIXED RENTAL Quantity	%	MORT-GAGE Quantity	%	F Value
Transaction cost	22***	0.4	124*	2.2	142	2.4	8.1***
Current input [c]	745	13.2	840	14.8	923	15.6	2.3*
Labor	1429	25.3	1355	23.9	1531	25.8	0.8
Capital [d]	281*	5.0	314	5.5	312	5.3	1.8
Land	2016**	35.7	2166**	38.2	1345	22.7	4.6***
Others [e]	35	0.6	60	1.0	24	0.4	1.4
Tenant	1127**	19.9	806***	14.2	1651	27.8	5.2 ***
Total paddy output/hectare (in kg)	5,654		5,666		5,928		0.04

[a] Factor payment converted to paddy equivalents by the factor-product price ratios
[b] Factor share: % factor payment to total paddy output
[c] = Seeds, fertilizers, herbicides and pesticides
[d] = machine rental
[e] = irrigation fee and tax
* significant at 10% level
** significant at 5% level
*** significant at 1% level

factor share for the tenant's managerial skill in fixed rental arrangement was factor share of land. The average factor share for land in fixed rental was highest compares other contract arrangements, which meant that the cost of using land for the tenant fixed rental arrangement was higher.

On the average, the factor shares of transaction cost per hectare of rice farming activities in one season was around 0.4-2.4 percent of the total factor payment and significantly different from each other. In one season of rice farm activities, the factor share of transaction cost was relatively lower compared to one term of contract. The total amount of transaction cost paid by the tenant and landowner for contract arrangement in one term of contract was around Rp214,081 to Rp1,008,114/ hectare (US $ 23.5 to US $ 110.7).

The total transaction cost was highest for mortgage arrangement given the contract period of two years. In the mortgage arrangement, the landowner received cash payments amounting to between Rp35, 000,000 (US $3, 889) and Rp70, 000,000 (US $7,778) per hectare for a minimum repayment period of two years, and paid for brokerage fee as 1 – 5 percent from total received cash. For the tenant with limited sources of capital, the high transaction cost was a barrier to accessing the land and, in some cases, it decreased their ability to buy inputs like fertilizers.

4.3. Factors Affecting Transaction Costs

The transaction cost model was used to examine the relationship between transaction cost and the factors affecting it. It also included some characteristics related to the tenant's and landlord's trustworthiness.

Because of the difficulty in measuring trust directly, the study used some variables that influenced the trust between the landlord and the tenant. The independent factors that influenced the total transaction cost were years of relation between the tenant and landlord, number of hired and family labor, quality of land, distance of the farm from the house, and total cropland area operated. The definitions of the explanatory variables are given in Table 5.

The summary statistics for the samples are shown in Table 6. Results showed an R^2 value of 0.34, which means that about 34 percent of the variation in the transaction cost could be explained by the explanatory variables.

The results were consistent with the present theory as previously explained. The more years the farmers used the land (duration of relation between landlord and tenants) and the higher the trust, and therefore the lower was the transaction cost. If the tenant was a relative of the landlord, the trust increased and the transaction cost decreased.

The more hired labor used, the greater was the potential of labor-shirking, thus the higher transaction cost. The more family labor was used, the lower the potential for labor-shirking, hence the lower the transaction cost. If the land was far from the house, uncertainty was high because of the difficulty in monitoring tenants' activities. Therefore, the farther the location of the land from the farmers house, the higher was the transaction cost.

Table 5. Summary statistics of independent variables of transaction costs in rice farms activities, West Java, Indonesia, 2004

VARIABLE	MEAN	STANDARD DEVIATION
Years relation (years)	10.9	11.7
Relative (%)	28	-
Hire labor (man-days)	39.8	19.02
Family labor (man-days)	38.8	27.5
Erosion (%)	43	-
Distance (meter)	1,890	2,255
Cropland area operated (hectare)	1.13	0.73

- Standard deviation of these variables have little meaning and thus are not presented

Table 6. Factors affecting transaction costs in rice farm activities, West Java, Indonesia, 2004

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	T-VALUE
Intercept	16.77909***	4.20639	3.99
Years relation (years)	-0.35436**	0.15232	-2.31
Relative(%)	-0.91752	2.41627	-0.38
Hired labor (man-days)	0.13395**	0.06888	1.94
Family labor (man-days)	-0.04212	0.04626	-0.91
Erosion (%)	-2.86565	2.35616	-1.22
Distance (meter)	0.00037	0.00054	0.68
Cropland area operated (hectare)	-0.25403	1.76816	-0.14
F value			3.66***
Pr > F			0.0017
R^2			0.34

** significant at 5% level
*** significant at 1% level

There were two variables related with the quality of land (erosion) and sizes of land holding that were not consistent with the theory. Datta et. al. (1986) stated the more eroded is the land, the higher is the potential for land mismanagement; and the greater the size of landholding, the greater the opportunity for land mismanagement. Because of diseconomies of scale in supervision, transaction cost will increase.

The results obtained, however, differed from the theory. The opportunity for land mismanagement was lower because the land size was less than 1.0 hectare. The descriptive statistics also indicated that hired labor was significantly and positively related with transaction cost. The greater the number of hired labor, the higher the potential for labor-shirking, thus incurring high transaction cost. Further, results

indicated the more number of years in which the farmer had cultivated the plot, the lower was the transaction cost. Some studies (Shaban, 1985 and Pender and Fatchamps, 2002) found similar results.

4.4. Landlord's Contract Choice in the Presence of Transaction Costs

If there are transaction costs, the choice of contract was determinate. To explore in more detail the relation of the contract choices and transaction cost, the study estimated the lease contract choices based on the landlord's perspective. Some explanatory variables, such as farmer's endowment, transaction cost, social factor, and farmer's characteristics were used. The summary statistics of explanatory variables are presented in Table 7.The theory stated that the greater value of asset, livestock, and crop land owned, the higher is the probability for the landlord to choose sharecropping because he/she would not have cash constraints (Pender and Fafchamps, 2002). The results in Table 8 indicate that the value of assets and livestock were significant and consistent with the theory. The cropland owned showed a negative sign.

The positive correlation between assets and sharecropping and negative correlation between assets with fixed rental and mortgage could be explained as follows. The farmer with more endowments tended to choose sharecropping due to the duration of the contract and the problem of payment. The landlord, on the other hand, chose mortgage because of capital constraint. The land was surrendered to the lender in exchange for a lump sum loan, and only returned upon repayment. If the farmer had enough assets, he/she did not choose mortgage because of the repayment problem.

A positive sign on transaction cost coefficient indicates that the higher the value of the transaction cost, the more likely that the landlord will choose sharecropping (Table 8). On the other hand, if the transaction cost is low, the more likely will the landlord choose mortgage or fixed rental. These findings indicate that the contract choice of the landlord was influenced by transaction cost.

Table 7. Summary statistics of explanatory variables of lease contract choice in rice farm activities, West Java, Indonesia, 2004

VARIABLE	MEAN (STANDARD DEVIATION)		
	Share Cropping	Fixed Rental	Mortgage
Cropland owned (hectare)	0.336 (0.488)	0.307 (0.547)	0.270 (0.469)
Household labor supply (man-days)	33.369 (33.834)	27.580 (26.496)	37.978 (43.486)
Asset (in score)[a]	10.690 (3.939)	13.150 (3.158)	12.154 (3.552)
Livestock [b] (Rp)	35,500 (65,342)	48,500 (17,930)	54,610 (84,910)
Years relation (years)	8.466 (8.350)	6.400 (7.91)	2.846 (3.331)
Relative (%)	28.0	20.0	20.8
Part-time farmers (%)	19.0	35.0	29.0
T-cost (Rp/Kg)	12.57 (21.43)	20.23 (16.60)	21.54 (46.45)

[a] Refer to Table 2 for details
[b] Ending inventory value at the time of interview

The existence of different contract arrangements in one place at the same time was influenced by the transaction cost. The landlord chose sharecropping arrangement if the transaction cost was high. This finding is relatively different from previous

studies. Steven Cheung (1969) postulated that sharecropping offers the advantage of risk-sharing while the fixed rental and fixed wages involved lower transaction cost. Other studies cited that landlords chose sharecropping since they faced high costs in extracting labor from hired workers due to possible adverse selection and moral hazard.

From previous studies, most of the transaction costs were monitoring costs, particularly for landlords with limited labor for supervision (e.g., those who were absentees, old, or had high opportunity costs) or with limited experience in supervision (Eswaran and Kotwal, 1985). In the study areas, most activities like land clearing, transplanting, and harvesting were done by task contracts (*borongan*), that the dominant content of transaction cost was information cost and not monitoring cost hence no supervision was needed.

This finding was supported by the fact that if the landowner was a relative of the tenant or if the tenant and the landlord have established a long-term relationship, the landlord chose fixed rental or mortgage. The farmer's number of years spent in tilling the plot reduced the broker's fee and the transaction cost. Pender and Fafchamps (2002) also found a positive association between the length of time that the tenant has farmed the land and sharecropping, because the dominant value of transaction cost was monitoring cost.

Table 8. Determinants of lease contract choice in rice farm activities, West Java, Indonesia, 2004

EXPLANATORY VARIABLE	SHARE CROPPING	FIXED RENTAL	MORTGAGE
Intercept	-2.890***	2.614**	2.030*
Cropland owned (hectares)	-0.497	0.438	0.346
Household labor supply (man-days)	0.132	0.099	-0.233
Asset (score)	0.121**	-0.099**	-0.020
Livestock (rupiah)	-0.040**	0.017	0.007
Years relation (years)	-0.046**	0.014	0.079**
Relative (%)	-0.192	-0.034	0.127
Part-time farmers (%)	0.003	-0.010	0.001
T-cost (Rp/Kg)	0.097***	-0.038***	-0.043***
Distance (meter)	0.367	0.219	-0.735*
Log likelihood	-46.36	-46.10	-43.54

* significant at 10% level
** significant at 5% level
*** significant at 1% level

The household labor supply had no significant impact on the landlord's choice. Since most of the labor activities were contracted by task, there was no need for the labor effort to be observed. If labor effort was unobservable, sharecropping will dominate fixed rental because of its risk pooling advantages (Stiglitz, 1974). Because of the above situation, part-time farmers tended to be indifferent in their choice of contracts, and chose mortgage or sharecropping depending on the information cost they had to pay.

Other factors that influenced the choice of contracts were risk and presence of other jobs for the farmers. Risk-sharing was the landlords' dominant reason for choosing a sharecropping arrangement in all of the villages studied except in Wanasari. Landlords did not choose sharecropping in Wanasari because there were other non-agricultural jobs available. The dominant reason for choosing fixed rental arrangement was to have another job and avoid risks.

In general, having personal relationship (i.e. relative) with farmers were not important factors in the landlords' decision for contract arrangements. Based on the personal interview with some landlords were in sharecropping contracts, the more important factors were the performance of the tenant in agricultural activities and their honesty. As such, when the landowner who chose sharecropping based on personal relationship with the tenant, tended to change into another contract arrangement if given the chance. For instance, some farmers who already chose sharecropping due to having personal relationship, wanted to shift to another contract arrangement for the next cropping.

V. Conclusions

The major components of transaction costs vary with type of land tenure contract arrangements. Information cost is the major cost component of transaction cost in fixed rental and mortgage arrangements. Brokerage fee required in mortgage and fixed rental arrangements practically accounts for the substantial part of information cost. In sharecropping arrangement, the main component was the monitoring cost.

Hired labor was significantly and positively related with transaction cost. The greater the number of hired labor, the higher is transaction cost due to the greater potential of labor-shirking. Transaction costs were lower when farmers cultivated their plot for a long time and there existed a long relationship between the landlord and the tenant. The latter reduced the brokerage fee and monitoring cost

The existence of different tenurial contracts in West Java was due to the presence of transaction costs and other factors such as having other job, assisting relatives and other farmers and risk sharing. The landlord's decision in contract arrangement depended on the value of the transaction cost. The landlord chose sharecropping arrangement if the transaction cost was high. Farmers with other jobs

preferred fixed rental while those who want to share the risk of rice farming selected sharecropping.

Land access by the poor through land tenure contracts to address equity in the distribution of land has become more difficult because of the transaction cost in land contract arrangements. The accumulation of land by some farmers by fixed rental and mortgage arrangements had caused more unbalanced land distribution in the villages. Moreover, this situation has been aggravated by the conversion of rice farms to other uses. For these reasons it has resulted in the polarization of rural communities into large farmers, small farmers, and the landless, a general phenomenon in West Java, Indonesia.

Most of the farm activities irrespective of tenural arrangements were done through labor and agricultural machinery contractual arrangement which significantly reduced the cost of labor monitoring.Rice farming remains the dominant source of income for farmers in the study area in the absence of alternative non-agricultural income generating activities. Owned land, sharecropping, and fixed rental arrangement generated identical outcomes in income and input in the absence of alternative employment opportunities for the tenants. Hence, a minimum subsistence income must be provided to the tenant.

LITERATURE CITED

AKERLOF, G. A. 1970. The market for 'lemons': Quality uncertainty and the market mechanism. Quarterly Journal of Economics. 84 1970): 488-500.

CHEUNG, S. N. S. 1969. The theory of share tenancy, with special application to Asian agriculture and the first phase of Taiwan land reform. Chicago: The University of Chicago Press. 234 p.

COASE, R.. 1961. The problem of social cost. Journal of Law and Economics. 3:1-44.

_____. 1992. Comments on Cheung. In: Werin, L. and H. Wijkander (Eds). Contract economics, transaction costs and efficiency in Western water allocation. American Journal of Agricultural Economics. 72: 1184-92.

DATTA, S.K., D. J. O'HARA and J. B. NUGENT. 1986. Choice of agricultural tenancy in the presence of transaction costs. Land Economics. 62(2): 145--158.

DYER. J. H and W. CHU. 2002. The role of trustworthiness in reducing transaction costs and improving performance: Empirical evidence from The United States, Japan, and Korea. Working paper.

ESWARAN, M. and A. KOTWAL 1985. A theory of contractual structure in agriculture. American Economic Review. 75: 352-367.

KUMAR, N., L.W. STERN, and J.C. ANDERSON. 1993. Conducting inter-organizational research using key informants. Academy of Management Journal. 36 (9): 1633-1651.

PENDER, J. and M. FAFCHAMPS. 2002. Land lease markets and agricultural efficiency: Theory and evidence from Ethiopia. Selected paper presented at the American Agricultural Economics Association's Annual Meeting, Long Beach, California, August 2002. (28 p.)

PINCUS, J. 1996. Class power and agrarian change. Land and labor in rural West Java. Great Britain: MacMillan Press LTD. 248 p.

ROUMASSET, J. A. and M. UY. 1987. Agency cost and agricultural firm. Land Economics. 63(3) :290-302.

SHABAN, R. A. 1985. Agricultural land tenancy with endogenous contracts: A theoretical and empirical investigation, Ph. D. dissertation, Stanford University.

SILBERBERG, E. and W. SUEN. 2001. The structure of economics. A mathematical analysis. Third edition. Singapore: McGraw-Hill International Edition. Economics Series. 668 p.

STIGLITZ, J. E. 1974. Incentives and risk sharing in sharecropping. Review Economics Studies. 41: 219-255.